



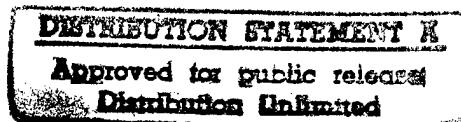
**The Research Foundation  
of State University of New York**

**The University at Stony Brook  
Office of Sponsored Programs  
Stony Brook, NY 11794-3366  
Telephone: 516-632-9039 Fax: 516-632-6963**

December 17, 1997

Program Manager/Officer ONR: 313  
Rabinder N. Madan  
Ballston Centre Tower One  
800 North Quincy Street  
Arlington, VA 22217-5660

RE: N000149511217



Dear Dr. Madan:

Enclosed is three copies of Dr. Rappaport's semi-annual Progress Report for the above mentioned award.

If you need any additional information, please call me at 516-632-9039.

Sincerely,

*Karen Pfister*  
Karen Pfister

Sponsored Program Coordinator

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File 431-0454A

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Stephen S. Rappaport			
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13. ABSTRACT (Maximum 200 words)			
<p>This report lists publications, patents, presentations and honors related to an ONR sponsored research grant on Mobile and Wireless Communications. The investigation develops new techniques, as well as performance evaluation models and tools for mobile and wireless communication systems. Configurations that support a mixture of mobile platform types and mixed types of telecommunications traffic are emphasized. Channel assignment and cellular layout strategies are investigated and an analytical framework based on multi-dimensional birth-death processes is developed to encompass a broad range of relevant issues. Specific topics include consideration of new channel borrowing schemes, mixed satellite and terrestrial systems, and methods that support platforms with differing mobilities and mixed teletraffic sources, such as data, voice and images. Important recent contributions include: (1) several important extensions of our analytical framework which allow platforms with highly variable mobility characteristics to be considered; (2) adaptive location management schemes for mobile communications; (3) performance models for mobile computing and communications; and, (4) cellular systems with multibeam antenna configurations.</p>			
14. SUBJECT TERMS		15. NUMBER OF PAGES	
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**OFFICE OF NAVAL RESEARCH  
PUBLICATIONS / PATENTS / PRESENTATIONS / HONORS REPORT**

for  
30 June 1997 through 31 December 1997

**R&T Number:**  
**Grant Number:** N00014-95-11217  
**Grant Title:** MOBILE AND WIRELESS COMMUNICATIONS

**Principal Investigator:** Stephen S. Rappaport  
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a. Number of papers submitted to refereed journals but not yet published:	<u>7</u>
b. Number of papers published in refereed journals: (list attached)	<u>0</u>
c. Number of books or chapters submitted but not yet published:	<u>0</u>
d. Number of books or chapters published: (list attached)	<u>1</u>
e. Number of printed technical reports & non-refereed papers: (list attached)	<u>6</u>
f. Number of patents filed: (list attached)	<u>0</u>
g. Number of patents granted: (list attached)	<u>0</u>
h. Number of invited presentations at workshops or professional society meetings.	<u>0</u>
i. Number of presentations at wrkshps or prof. soc. meetings. (list attached)	<u>2</u>
j. Honors/Awards/Prizes for Contract/Grant Employees: (List attached). (Includes scientific soc. awards/offices, Promotions, Faculty Award/Offices).	<u>5</u>
k. Total number of graduate students and post-docs supported at least 25% this year on this contract, grant: <i>graduate students</i> <u>5</u> and <i>post-docs</i> <u>0</u>	
grad student female	0
grad student minority	0
grad student Asian e/n	4
post-doc female	0
post-doc minority 0	
post-doc Asian e/n	0

*file: rpt97.dec*

**PUBLICATIONS, PATENTS, PRESENTATIONS, AND HONORS REPORT****b. Papers Published in Refereed Journals****d. Books or Chapters Published**

- [1] Y. Park and S.S. Rappaport, "Cellular Communication Systems with Voice and Background Data," *Mobile Multimedia Communications*, Plenum Publishers. November 1997.

**e. Technical Reports and Non-Refereed Papers**

- [1] D. Gu and S.S. Rappaport, "A Dynamic Location Tracking Strategy for Mobile Communication Systems," CEAS Technical Report No. 741, July 24, 1997, College of Engineering and Applied Sciences, State University of New York, Stony Brook, NY 11794.
- [2] P.V. Orlik and S.S. Rappaport, "A Model for Teletraffic Performance and Channel Holding Time Characterization in Wireless Cellular Communications with General Session and Dwell Time Distributions," CEAS Technical Report No. 742, July 31, 1997, College of Engineering and Applied Sciences, State University of New York, Stony Brook, NY 11794.
- [3] Guodong Zhang and Stephen S. Rappaport, "Simulation of Blocking, Hand-off and Traffic Performance for Cellular Communication Systems with Mixed Platforms," CEAS Technical Report No. 743, August 4, 1997, College of Engineering and Applied Sciences, State University of New York, Stony Brook, NY 11794.
- [4] Y. Park and S.S. Rappaport, "Performance Analysis of Session Oriented Data Communications for Mobile Computing in Cellular Systems," CEAS Technical Report No. 744, August 4, 1997, College of Engineering and Applied Sciences, State University of New York, Stony Brook, NY 11794.
- [5] J.-L. Pan, S.S. Rappaport, and P.M. Djuric, "Multibeam Cellular Communication Systems with Dynamic Channel Assignment across Multiple Sectors," CEAS Technical Report No. 749, October 22, 1997, College of Engineering and Applied Sciences, State University of New York, Stony Brook, NY 11794.
- [6] D. Gu and S.S. Rappaport, "Location Tracking in Hierarchical Cellular Systems: An Adaptive Algorithm," CEAS Technical Report No. 750, November 14, 1997, College of Engineering and Applied Sciences, State University of New York, Stony Brook, NY 11794.

**f. Patents Filed****g. Patents Granted**

**i. Presentations at Workshops and Professional Society Meetings**

- [1] H. Takanashi and S.S. Rappaport, "Analysis of a Simple PCS System with Nonuniformly Distributed Mobile Users," Proc. IEEE International Conference on Universal Personal Communications, ICUPC '97, San Diego, Oct. 12-16, 1997, pp. 572-576.
- [2] P.V. Orlik and S.S. Rappaport, "A Model for Teletraffic Performance and Channel Holding Time Characterization in Wireless Cellular Communication," Proc. IEEE International Conference on Universal Personal Communications, ICUPC '97, San Diego, Oct. 12-16, 1997, pp. 671-675. (with P.V. Orlik)

**j. Honors/Awards/Prizes****S.S. Rappaport**

- [1] Technical Program Committee, ICUPC '97 San Diego.
- [2] Vice-Chair, Technical Program, ICUPC '98 Florence.
- [3] Editorial Board, *Wireless Networks Journal*.
- [4] State University of New York at Stony Brook, - Faculty Senate.
- [5] Certificate of Appreciation for Service to IEEE Communications Society as Technical Committee Chair (received November 1997).